

IN THE CLAIMS:

Please cancel Claims 1 through 31, without prejudice.

Please add the following claims:

- - 32. (new) A method of producing high grade coke from low grade material without causing a pollution problem, comprising the acts of:

displacing a mixture of low grade non-coking inexpensive coal fines and another type of inexpensive carbonaceous fines comprised of waste coke fine without elutriation of the fines, as a feedstock influent into a pyrolyzer;

pyrolyzing the displaced mixture in the pyrolyzer;

discharging coke and pyrolytic by-products as effluents from the pyrolyzer. - -

- - 33. (new) A method according to Claim 32 further comprising the acts of:

feeding back tar effluent by-product from the pyrolyzer to the feedstock influent mixture;

feeding back combustible off-gas effluent by-product from the pyrolyzer to the pyrolyzer and using it as a source of fuel in the pyrolyzer. - -

- - 34. (new) A method according to Claim 32 further comprising the act of obtaining a mixture comprising waste coal fines and waste coke fines prior to the introducing act. - -

- - 35. (new) A method according to Claim 32 further comprising the act of crushing low grade coal and/or the carbonaceous waste coke prior to the introducing act, to obtain the fines. - -

- - 36. (new) A method according to Claim 32 further comprising the act of forming the mixture into solid objects prior to the introducing act. - -

- - 37. (new) A method according to Claim 35 wherein the discharging act comprises discharging the coke as solid objects. - -

- - 38. (new) A method according to Claim 33 wherein the first feeding act comprises combining the feedback tar, a synthetic binder and the mixture of fines prior to the introducing act. -

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- - 39. (new) A method according to Claim 33 wherein the by-product tar is fed back mixed with another binder additive and combined with the mixture of coal fines and waste coke fines prior to the introducing act. - -

- - 40. (new) A method according to Claim 32 wherein the discharging act comprises cooling the by-products and condensing tar to separate the tar from off-gas. - -

- - 41. (new) A method of producing coke from a mixture of non-prime coal fines and waste coke fines comprising the acts of:

displacing without elutriation a mixture of low grade coal fines and another type of carbonaceous comprising waste coke fines as a feedstock influent into a pyrolyzer;

pyrolyzing the mixture in the pyrolyzer;

discharging segregated coke and pyrolytic by-products as effluents from the pyrolyzer. - -

- - 42. (new) A method according to Claim 41 further comprising the acts of:
separating the pyrolytic by-products into tar and combustible off-gas;
combining the separated tar as a binder with the mixture of coal and coke fines in the
mixture;
returning the combustible off-gas to the pyrolyzer as a source of fuel. - -

- - 43. (new) A method according to Claim 41 wherein the introducing act comprises
obtaining a mixture comprising waste coke fines and waste coal fines. - -

- - 44. (new) A method according to Claim 41 further comprising the act of crushing at least
some of the coke and/or the coal, prior to the introducing act. - -

- - 45. (new) A method according to Claim 41 further comprising the act of forming the
mixture into solid objects prior to the introducing act. - -

- - 46. (new) A method according to Claim 45 wherein the discharging act comprises
discharging the coke from the pyrolyzer as solid objects. - -

- - 47. (new) A method according to Claim 42 wherein the combining act comprises
combining the separated tar, a synthetic binder and the mixture of coal and coke fines prior to the
introducing act. - -

- - 48. (new) A method according to Claim 42 wherein the separated tar is fed back to the coal and coke mixture prior to the introducing act. - -

- - 49. (new) A method according to Claim 42 wherein the separating act comprises cooling the by-products to condense tar to separate the tar from off-gas. - -

- - 50. (new) A method of producing coke from low grade coal and coke fines, comprising the acts of:

obtaining and mixing low grade coal fines and coke fines;

displacing the mixture of lower grade coal fines and waste coke fines as an influent into a pyrolyzer without drying the fines ;

pyrolyzing the mixture in the pyrolyzer;

discharging segregated coke and pyrolytic by-products comprising combustible off-gas and tar as effluents from the pyrolyzer;

separating the pyrolytic by-products into segregated tar and combustible off-gas;

adding the segregated tar as a binder to the coal and coke fines mixture;

returning the segregated combustible off-gas to the pyrolyzer as a source of fuel. - -

- - 51. (new) A method according to Claim 50 further comprising the act of crushing oversized unwashed waste coke and/or unwashed oversized low grade coal, to correctly size the fines. - -

- - 52. (new) A method according to Claim 50 further comprising the act of forming the mixture into solid objects to the introducing act. - -

- - 53. (new) A method according to Claim 52 wherein the discharging act comprises discharging the coke from the pyrolyzer as solid objects. - -

- - 54. (new) A method according to Claim 50 wherein the adding act comprises combining the separated tar, a synthetic binder and the mixture of coal and coke fines prior to the introducing act. - -

- - 55. (new) A method according to Claim 50 wherein the separated tar is fed back to the mixture of coal and coke fines. - -

- - 56. (new) A method according to Claim 50 wherein low grade coal comprises 20-40% by weight of the coal and coke mixture. - -

- - 57. (new) A method according to Claim 50 wherein the coke fines comprise petroleum coke fines which comprise 40-70% by weight of the coal and coke mixture. - -

- - 58. (new) A method according to Claim 50 wherein the coke fines comprise coke breeze fines which comprise 5-10% by weight of the coal and coke mixture.

-- 59. (new) A method according to Claim 50 wherein the pyrolyzing act comprises heating the introduced mixture to a temperature within the range of 800-1100°C at a rate within the range of 1500-2000°C/hour to lower coke volatility below 2%. --

-- 60. (new) A method according to Claim 50 wherein the separating act comprises cooling the by-products to about 300°C and condensing the tar to separate the tar from the off-gas. --

-- 61. (new) A method of producing high quality coke from a mixture of low grade and/or waste carbonaceous materials at a much lower cost comprising the acts of:

absent elutriation, displacing a mixture of low grade coal fines and waste coke fines as an influent into a pyrolyzer;

pyrolyzing the mixture of fines in the pyrolyzer;

discharging the coke, and pyrolytic by-products from the pyrolyzer. --

-- 62. (new) A method according to Claim 61 wherein the by-products comprise tar and combustible gas and further comprising the acts of:

condensing the tar;

using the tar as a binder for the mixture of coal and coke;

using the combustible off-gas as a source of fuel in the pyrolyzer. --

- - 63. (new) A method of producing coke from non-traditional carbonaceous materials comprising the acts of:

displacing a mixture of waste coke fines and non-coking grade coal fines as an influent into a pyrolyzer absent washing and drying of the fines as they are introduced;

pyrolyzing the mixture in the pyrolyzer;

discharging the coke, and pyrolytic by-products comprising combustible off-gas and tar as effluents from the pyrolyzer. - -

- - 64. (new) A method according to Claim 63 comprising the further acts of:

condensing the tar to separate the tar and off-gas;

using the tar as a binder for the mixture fines prior to the mixing act;

using the combustible off-gas as a source of fuel in the pyrolyzer. - -

- - 65. (new) A method according to Claim 64 wherein all condensed tar is utilized as binder and all combustible off-gas is used to fuel the pyrolyzer. - -

- - 66. (new) A method according to Claim 64 wherein the condensed tar is the sole binder source and the combustible off-gas is the sole source of fuel for the pyrolyzer. - -

- - 67. (new) A method of cost effectively producing high quality coke from a mixture of non-traditional carbonaceous materials comprising the acts of:

displacing into a pyrolyzer a mixture comprising low grade coal fines and coke fines as salvage from prior production of coke without washing or elutriating the fines during the displacement;

pyrolyzing the mixture and obtaining segregated coke and by-products. - -

- - 68. (new) A method of producing coke, comprising the acts of:

mixing a binder, low grade non-prime unwashed coal fines selected from the group consisting of waste non-coking coal fines and non-coking coal fines and salvage coke fines selected from the group consisting of waste petroleum fines, waste char fines and waste coke breeze, without regard to a free swelling index value;

displacing the mixture into a pyrolyzer without wetting or drying the displaced mixture;

pyrolyzing the mixture to derive coke, tar and combustible off-gas. - -

- - 69. (new) A method according to Claim 68 wherein the method is performed in a closed system and further comprising the acts of:

causing all of the tar to comprise the binder;

fueling the pyrolyzer with the combustible off-gas. - -